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Recently received from Mr. C. G. Pringle; collected in August, 1884, in Southern Arizona.

The plant somewhat resembles *C. Californicus*, Watson,* but differs in its narrow leaves, shorter involucre, shorter and non-flexuose, fewer-flowered spikelets.

A Third Coat in the Spores of the Genus Onoclea.—The presence of three coats in the spores of *Equisetum* has long been known to botanists, but, as far as I am aware, it is generally supposed that no ferns have more than two.

Having had occasion to repeatedly study the germination of the spores of *Onoclea Struthiopteris*, I was for a long time perplexed by the appearance of certain lines on the surface of the spore which I could not explain.

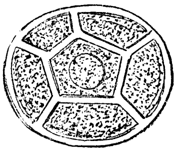
Fig. 1.

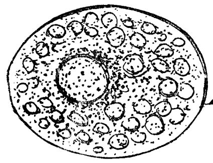
Fig. 2.

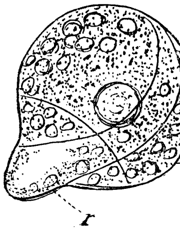
Fig. 3.

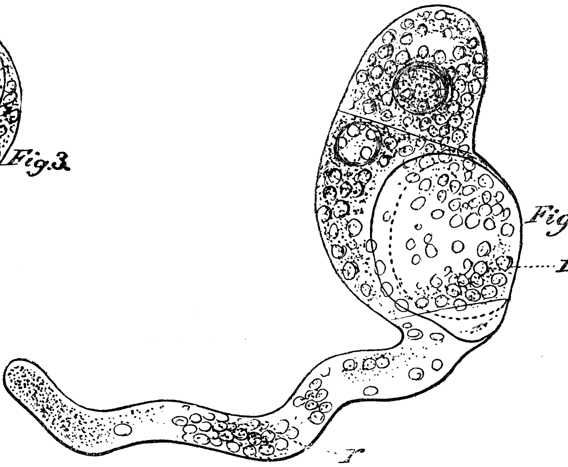
Fig. 4.

For some time these were not noticed in the spore at the commencement of germination, owing to the opaque nature of the contents; but, as the cells became larger and the contents clearer, these lines became very conspicuous.

After repeated sowings of spores, and careful study of the first stages of germination, specimens in the condltion of Fig. 3 were found in which the root-hair was apparently developed from the interior of the spore and protruded through the wall. Further investigation showed beyond any doubt that the supposed endospore actually split, and that through the cleft at one end the root-hair protruded, and at the other the first cell of the prothallium. The spores of the ferns of the genus *Onoclea*, as is usual in other ferns, are covered with a thick, dark brown exospore, or coat. (Fig. 1.) In most ferns this remains attached to the basal cell of the prothallium, concealing a large portion of it, and, indeed, this is often the case in both *O. Struthiopteris* and *O. sensibilis*, but in many cases in both ferns it is completely detached by the swelling of the spore in germinating, leaving the spore apparently covered only with a thin, transparent membrane (Fig. 2.) At the commencement of active growth, however, this membrane is seen to split along one side, and through the cleft thus formed the true endospore protrudes in the form of a root-hair at one end, and the basal cell of the prothallium at the other, which soon becomes separated from the root-hair by a transverse septum (Figs. 3 and 4.) In Fig. 4 the basal cell has become again divided so as to form two cells besides the first root-hair. At this stage, with a little care, the two lobes of the second covering (Figs. 4 and 5, L) can be clearly seen. The edges of these lobes were the lines that puzzled me first. These lobes follow so nearly the lobes of the exospore, in those cases where it remains attached, that it is then impossible to detect them.

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* Bot. Cal., ii., 216 (*C. speciosus*, Torr., Mex. Bound. Surv., 226.)

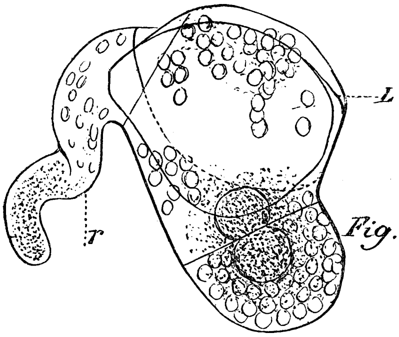

Fig. 5.

This accessory covering of the spore was first observed in *O. Struthiopteris*, but, knowing the close resemblance of the spores of *O. sensibilis* to those of the former species, I conjectured that the same peculiarity might be detected in them, and experiment showed that this was the case. I have not detected it in other genera examined, but, as in all cases, the exospore adhered so firmly to the spore as to interfere seriously with observations, I do not think it at all impossible that it does exist.

These observations may be readily verified in either species, as the spores germinate in a few days if simply placed in water and kept in a warm place.

EXPLANATION OF FIGURES.—1. Spore of *O. Struthiopteris* still enclosed in the exospore. 2. A similar spore in which the exospore has been cast off. 3. Spore with the second coat split, allowing the root-hair (*r*) to protrude. 4. Older prothallium, showing the lobes of the second coat (L.) 5. Similar prothallium of *O. sensibilis*. All magnified 500 diameters.

DOUGLAS H. CAMPBELL.